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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/726,794

Applicant(s)

KOBAYASHI, OSAMU

Examiner

Kenan Cehic

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14, 17-34 and 37-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17-34 and 37-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :09/25/2007, 08/16/2007, 04/02/2007 01/03/2007, 10/25/2006, 10/04/2006, 08/28/2006, 05/15/2006, 04/17/2006, 02/06/2006, 12/05/2005, 09/19/2005.

## **DETAILED ACTION**

### ***Response to Amendment***

1. The indicated allowability of claim 41-43 is withdrawn in view of the newly discovered reference(s) to Wolf et al. (US 6,914,637 B1). Rejections based on the newly cited reference(s) follow.

### ***Specification***

2. The abstract of the disclosure is objected to because it contains the terms "is disclosed". Correction is required. See MPEP § 608.01(b).
3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Objections***

5. Claim 7, 10, 27 are objected to because of the following informalities: For claim 7, the claim limitation "the respective virtual link" in line 2, is the first occurrence. It is suggested to applicant to change this to --a respective virtual link---. Similar problems exist in claim 10 line 1, claim 27 line 2. Appropriate correction is required.

***Double Patenting***

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d

2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-4, 6, 8-14, 17,19-26, 28-34, 37, 39 21-26,28-34,37,39,40,44-46 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,2,4-13-18 of US 7,177,329 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following:

Instant Application 10726794	US Patent # 7,177,329
Claim 1. A packet based display interface arranged to couple a multimedia source device to a multimedia sink device, comprising: a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a multimedia data packet stream formed of a number of multimedia data packets based upon the source packet data stream in accordance with a link rate that is independent of the	Claims 1,2,13-15 Claim 1: A transmission efficient packet based display interface arranged to couple a multimedia source device to a multimedia sink device, comprising: a bi-directional auxiliary channel arranged to transfer information between the multimedia source device and the multimedia sink device and vice versa, wherein the information transferred over the auxiliary channel includes a set of packet attributes; and a unidirectional main link arranged to transport multimedia data packets from the multimedia source device to the multimedia sink device each having a multimedia data packet header wherein neither the main link nor the auxiliary channel include separate clock signal lines,

<p>native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the multimedia data packets from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa wherein when the multimedia data stream includes an audio stream and there is no associated time stamp, then the source device informs the multimedia sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.</p>	<p>and wherein each of the headers is reduced in size over what would otherwise be necessary since the packet attributes are communicated via the auxiliary channel prior to the transmission of the multimedia data packets over the main link and not in the packet headers.</p> <p>Claim 2. A transmission efficient packet based display interface as recited in claim 1, further comprising: a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and wherein the main link has an associated link transmission rate that is independent of the native stream rate.</p> <p>Claim 13. A transmission efficient packet based display interface as recited in claim 2, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the data packets and wherein the time stamp is based upon a determination of a number of native stream clocks in 2.sup.20 cycles of link cycle clock frequency period.</p> <p>Claim 14. A transmission efficient packet based display interface as recited in claim 13, wherein when the multimedia data stream is an audio stream, then there is no associated time stamp.</p> <p>Claim 15. A transmission efficient packet based display interface as recited in claim 14, wherein the source device informs the display device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.</p>
<p>Claim 2. A packet based display interface as recited in claim 1, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data</p>	<p>Claim 4. A transmission efficient packet based display interface as recited in claim 3, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an</p>

stream link rate that is independent of the native stream rate.	associated adjustable data stream link rate that is independent of the native stream rate.
Claim 3. A display interface as recited in <b>claim 1</b> , wherein the bidirectional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.	Claim 5. A transmission efficient packet based display interface as recited in claim 4, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel for carrying information from the source device to the sink device in concert with the back channel
Claim 4. A display interface as recited in claim 2, wherein the main link unit further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate	Claim 6. A transmission efficient packet based display interface as recited in claim 5, wherein the main link further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate
Claim 6. A display interface as recited in claim 5, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	Claim 7. A transmission efficient packet based display interface as recited in claim 6, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.
Claim 8. A display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to automatically determine when an active sink device is connected to the linking unit.	Claim 8. A transmission efficient packet based display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to automatically determine when an active sink device is connected to the display interface.
Claim 9. A display interface as recited in claim 2, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.	Claim 9. A transmission efficient packet based display interface as recited in claim 1, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.
Claim 10. A display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets information and the results of training sessions	Claim 10. A transmission efficient packet based display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets



information.	information and the results of training sessions information
Claim 11. A display interface as recited in claim 2, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	Claim 11. A transmission efficient packet based display interface as recited in claim 1, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.
Claim 12. A display interface as recited in claim 1, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 12. A transmission efficient packet based display interface as recited in claim 1, wherein the main link rate is adjustable in a range that includes 1.0 Gigabits per second (Gbps) to 2.5 Gbps.
Claim 13. A display interface as recited in claim 1, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	Claim 13. A transmission efficient packet based display interface as recited in claim 2, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the data packets and wherein the time stamp is based upon a determination of a number of native stream clocks in 2.sup.20 cycles of link cycle clock frequency period.
Claim 14. A display interface as recited in claim 13, wherein the time stamp is based upon a determination of a number of native stream clocks in 2" cycles of link cycle clock frequency period.	Claim 13. A transmission efficient packet based display interface as recited in claim 2, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the data packets and wherein the time stamp is based upon a determination of a number of native stream clocks in 2.sup.20 cycles of link cycle clock frequency period.
Claim 17. A display interface as recited in <b>claim 1</b> , wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	Claim 16. A transmission efficient packet based display interface as recited in claim 15, wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.

<p>Claim 19. A display interface as recited in claim 1, wherein some of the multimedia data packets include a number of sub-packets.</p>	<p>Claim 17. A transmission efficient packet based display interface as recited in claim 1, wherein some of the multimedia data packets include a number of sub-packets each having an associated sub-packet header.</p>
<p>Claim 20. A display interface as recited in claim 19 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.</p>	<p>Claim 18. A transmission efficient packet based display interface as recited in claim 17 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.</p>
<p>Claim 21. A packet based method of coupling a multimedia source device to a multimedia sink device, comprising: providing a source device having a transmitter unit coupled thereto; providing sink device having a receiver unit coupled thereto; receiving a source data stream in accordance with a native stream rate by the transmitter unit; coupling the transmitter unit and the receiver unit by way of a linking unit; forming a multimedia data packet stream formed of a number of multimedia data packets based upon the source data stream; and transferring the multimedia data packet stream in accordance with a link rate between the transmitter unit and the receiver unit, wherein when the multimedia data packet stream includes an audio stream having; no associated time stamp, then the source device informs the sink device by wav of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.</p>	<p>See Claims 1,2,13-15 above.</p>

Claim 22. A method as recited in claim 21, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.	Claim 4. A transmission efficient packet based display interface as recited in claim 3, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.
Claim 23. providing a unidirectional main link arranged to carry the multimedia data packets from the transmitter unit to the receiver unit; and providing a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa.	See claim 1 above.
Claim 24. A method as recited in claim 23, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.	Claim 5. A transmission efficient packet based display interface as recited in claim 4, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel for carrying information from the source device to the sink device in concert with the back channel
Claim 25. a number of virtual links each being associated with a particular one of the multimedia data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.	Claim 6. (see above)
Claim 26. wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	See Claim 7 above.
Claim 28. automatically determining when an active sink device is connected to the linking unit by a hot plug detector unit.	See claim 8 above.
Claim 29. A method as recited in claim 22,	See claim 9 above.

wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream	
Claim 30. A method as recited in claim 21, wherein the information includes sync loss information, dropped packets information and the results of training sessions information.	See claim 10 above.
Claim 31. A method as recited in claim 22, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	See claim 11 above.
Claim 32. A method as recited in claim 21, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 12 above.
Claim 33. A method as recited in claim 21, wherein the receiver unit includes a timebase recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	See claim 13 above.
Claim 34. A method as recited in claim 33, wherein the time stamp is based upon a determination of a number of native stream clocks in 2 <sup>n</sup> cycles of link cycle clock frequency period	See Claim 13 above
Claim 37. A method as recited in <b>claim 21</b> , wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	See claim 16 above.
Claim 39. A method as recited in claim 21,	See claim 17 above.

wherein some of the multimedia data packets include a number of sub-packets.	
Claim 40. A method as recited in claim 39 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	See claim 18 above.
Claim 40. A method as recited in claim 39 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	See claim 18 above.
Claim 44. <b>Computer readable medium encoded with a computer program</b> for packet based coupling of a source device and a display device. comprising: computer code for providing a source device having a transmitter unit coupled thereto; computer code for providing sink device having a receiver unit coupled thereto; receiving a source data stream in accordance with a native stream rate by the transmitter unit; computer code for coupling; the transmitter unit and the receiver unit by way of a linking; unit; computer code for forming a multimedia data packet stream formed of a number of multimedia data packet based upon the source data stream; and	See claim 1,2,13-15

computer code for transferring the multimedia data packet stream in accordance with a link rate between the transmitter unit and the receiver unit, wherein when the multimedia data stream includes an audio stream having; no associated time stamp, then the source device informs the sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.	
Claim 45. Computer readable medium as recited in claim 44, further comprising: computer code for providing a set of display attributes to the source device	See claim 1 above.
Claim 46. <b>Computer readable medium</b> as recited in claim 45, further comprising computer code for describing a format for the source data stream and the display device.	See claim 1 above.

The Instant application has a similar scope of invention as in US patent 7,177,329 B2, but in different wording or format of claims. The common subject matter is a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate;

a receiver unit coupled to the sink device; and a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a multimedia data packet stream formed of a number of multimedia data packets based upon the source packet data stream in accordance with a link rate that is independent of the native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the multimedia data packets from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer

information between the transmitter unit and the receiver unit and vice versa wherein when the multimedia data stream includes an audio stream and there is no associated time stamp, then the source device informs the multimedia sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.

It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re karlson, 136 USPQ 184 (CCPA). Also note Ex Parte Raine, 186 USPQ 375 (bd. App. 1969); omission of a reference element whose function is not needed would have been obvious to one skilled in the art.

1,2,13-15

10. Claim 7, 18, 27 38, are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,2,13-15 of U.S. Patent No. US 7,177,329 in view of Wolf et al (US 6,914,637 B1).

For claim 7, 18, 27, 38, claims 1,2,13-15 of U.S. Patent No. US 7,177,329 teach the claimed invention as described in paragraph 9.

Furthermore for claim 7 and 27, claims 1,2,13-15 of U.S. Patent No. US 7,177,329 teach 1, wherein the source data stream is packetized over the respective virtual link (see claim 6).

Patent No. US 7,177,329 does not disclose:

For claim 7 and 27, a mapping definition.

For claim 18 and 38, wherein the number of multimedia data streams are multiplexed to form a single data stream suitable for transmission over the linking unit.

Wolf from the same or similar field of endeavor discloses a display system/interface with a mapping features:

For claim 7 and 27, Wolf discloses a mapping definition (see column 21 lines 59-61 "code word...mapped to source data").

For claim 18 and 38, Wolf discloses wherein the number of multimedia data streams (see Figure 2 "DigVideo" and Figure 8 "Packet 1", "Packet 2...") are multiplexed (see column 29 lines 37-42 "two or more streams....time-multiplexer") to form a single data stream ( Figure 8 "Packet 1", "Packet 2...") suitable for transmission over the linking unit (see Figure 2, CH0-CHC and column 29 lines 39-41 "multiplexed...one ...Channel").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Patent No. US 7,177,329 by using the features, as taught by Wolf, in order to a mapping features for a source (see column 21 lines 59-61).

11. Claims 1-4, 6, 8-14, 17,19,20, 21-26,28-34,37,39,40,44-46 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1,10,11,14-21,22-26 of US 7,068,686 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following:



Claim 1. A packet based display interface arranged to couple a multimedia source device to a multimedia sink device, comprising:  
a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate;  
a receiver unit coupled to the sink device; and  
a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a multimedia data packet stream formed of a number of multimedia data packets based upon the source packet data stream in accordance with a link rate that is independent of the native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the multimedia data packets from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa wherein when the multimedia data stream includes an audio stream and there is no associated time stamp, then the source device informs the multimedia sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.

Claim 9, 11, 22,23

Claim 9. A transmission efficient packet based display interface arranged to couple a multimedia source device to a multimedia sink device, comprising: a bi-directional auxiliary channel arranged to transfer information between the multimedia source device and the multimedia sink device and vice versa, wherein the information transferred over the auxiliary channel includes a set of packet attributes; and a unidirectional main link arranged to carry a number multimedia data packet streams from the multimedia source device to the multimedia sink device each formed of a plurality of multimedia data packets having a multimedia data packet header, wherein each of the headers is reduced in size over what would otherwise be necessary since the packet attributes are communicated via the auxiliary channel prior to the transmission of the main link packets over main link thereby commensurably reducing the packet overhead, and wherein the main link includes a number of virtual links each being associated with a particular one of the multimedia data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.

Claim 11. A transmission efficient packet based display interface as recited in claim 9, further comprising: a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and wherein the main link has an associated link transmission rate that is independent of the native stream rate.

Claim 22. A transmission efficient packet based display interface as recited in claim 21, wherein when the multimedia data stream is an audio stream, then there is no associated time stamp.

	Claim 23. A transmission efficient packet based display interface as recited in claim 22, wherein the source device informs the display device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.
Claim 2. A packet based display interface as recited in claim 1, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.	Claim 10. A transmission efficient packet based display interface as recited in claim 9, wherein associated ones of the multimedia data packets form a particular multimedia data packet stream that is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.
Claim 3. A display interface as recited in <b>claim 1</b> , wherein the bidirectional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.	Claim 14. A transmission efficient packet based display interface as recited in claim 13, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel for carrying information from the source device to the sink device in concert with the back channel
Claim 4. A display interface as recited in claim 2, wherein the main link unit further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate	Claim 9. (see above)
Claim 6 .A display interface as recited in claim 5, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	Claim 15. A transmission efficient packet based display interface as recited in claim 9, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.
Claim 8. A display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to	Claim 16. A transmission efficient packet based display interface as recited in claim 9, further comprising: a hot plug event

automatically determine when an active sink device is connected to the linking unit.	detector unit arranged to automatically determine when an active sink device is connected to the display interface
Claim 9. A display interface as recited in claim 2, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.	Claim 17. transmission efficient packet based display interface as recited in claim 9, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream
Claim 10. A display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets information and the results of training sessions information.	Claim 18. A transmission efficient packet based display interface as recited in claim 9, wherein the information includes sync loss information, dropped packets information and training sessions information.
Claim 11. A display interface as recited in claim 2, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	Claim 19. A transmission efficient packet based display interface as recited in claim 9, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.
Claim 12. A display interface as recited in claim 1, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 20. A transmission efficient packet based display interface as recited in claim 9, wherein the main link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.
Claim 13. A display interface as recited in claim 1, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	Claim 21. A display interface as recited in claim 11, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the data packets and wherein the time stamp is based upon a determination of a number of native stream clocks in 2.sup.20 cycles of link cycle clock frequency period.
Claim 14. A display interface as recited in claim 13, wherein the time stamp is based	Claim 21 (see above)

upon a determination of a number of native stream clocks in $2^{20}$ cycles of link cycle clock frequency period.	
Claim 17. A display interface as recited in <b>claim 1</b> , wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	Claim 24. A transmission efficient packet based display interface as recited in claim 23, wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.
Claim 19. A display interface as recited in claim 1, wherein some of the multimedia data packets include a number of sub-packets.	Claim 25. A display interface as recited in claim 9, wherein some of the multimedia data packets include a number of sub-packets each having an associated sub-packet header.
Claim 20. A display interface as recited in claim 19 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	Claim 26. A display interface as recited in claim 25 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.
Claim 21. A packet based method of coupling a multimedia source device to a multimedia sink device, comprising: providing a source device having a transmitter unit coupled thereto; providing sink device having a receiver unit coupled thereto; receiving a source data stream in accordance with a native stream rate by the transmitter unit; coupling the transmitter unit and the receiver unit by way of a linking unit; forming a multimedia data packet stream formed of a number of multimedia data packets based upon the source data stream; and transferring the multimedia data packet stream in accordance with a link rate between the transmitter unit and the receiver unit, wherein	See claims 9, 11, 22,23 above

when the multimedia data packet stream includes an audio stream having; no associated time stamp, then the source device informs the sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.	
Claim 22. A method as recited in claim 21, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.	See claim 10 above.
Claim 23. providing a unidirectional main link arranged to carry the multimedia data packets from the transmitter unit to the receiver unit; and providing a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa.	See claim 9 above
Claim 24. A method as recited in claim 23, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.	See claim 14 above.
Claim 25. a number of virtual links each being associated with a particular one of the multimedia data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.	See claim 9 above.

Claim 26. wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	See claim 15 above.
Claim 28. A method as recited in claim 21, further comprising: automatically determining when an active sink device is connected to the linking unit by a hot plug detector unit.	See claim 16 above.
Claim 29. wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.	Claim 17 above
Claim 30. A method as recited in claim 21, wherein the information includes sync loss information, dropped packets information and the results of training sessions information.	See Claim 18 above.
Claim 31. A method as recited in claim 22, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	See claim 19 above.
Claim 32. A method as recited in claim 21, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	See claim 20 above.
Claim 33. A method as recited in claim 21, wherein the receiver unit includes a timebase recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	See claim 21 above.
Claim 34. A method as recited in claim 33, wherein the time stamp is based upon a determination of a number of native stream clocks in 2 <sup>n</sup> cycles of link cycle clock frequency	See claim 21 above.

period.	
Claim 37. A method as recited in <b>claim 21</b> , wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	See claim 24 above.
Claim 39. A method as recited in claim 21, wherein some of the multimedia data packets include a number of sub-packets.	See claim 25 above.
Claim 40. A method as recited in claim 39 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	See claim 26 above.

<p>Claim 44. Computer readable medium encoded with a computer program for packet based coupling of a source device and a display device, comprising: computer code for providing a source device having a transmitter unit coupled thereto; computer code for providing sink device having a receiver unit coupled thereto; receiving a source data stream in accordance with a native stream rate by the transmitter unit; computer code for coupling; the transmitter unit and the receiver unit by way of a linking; unit; computer code for forming a multimedia data packet stream formed of a number of multimedia data packet based upon the source data stream; and computer code for transferring the multimedia data packet stream in accordance with a link rate between the transmitter unit and the receiver unit, wherein when the multimedia data stream includes an audio stream having; no associated time stamp, then the source device informs the sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.</p>	<p>See claims 9, 11, 22,23 above</p>
<p>Claim 45. Computer readable medium as recited in claim 44, further comprising: computer code for providing a set of display attributes to the source device</p>	<p>Claim 6. Computer program product stored on a computer-readable storage medium for efficiently transmitting packet data between a multimedia source device and a multimedia sink device, comprising: computer code for transferring information between the multimedia source device and the multimedia sink device and vice versa by way of a bi-directional auxiliary</p>



	channel, wherein the information transferred over the auxiliary channel includes a set of packet attributes; computer code for passing a number multimedia data packets from the transmitter unit to the receiver unit each having a size reduced multimedia data packet header by a unidirectional main link, wherein each of the headers is reduced in size over what would otherwise be necessary since the packet attributes are communicated via the auxiliary channel prior to the transmission of the main link packets over the main link thereby commensurably reducing the packet overhead, and wherein associated ones of the multimedia data packets form a particular multimedia data packet stream that is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate; and computer code for forming a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.
<b>Claim 46. Computer readable medium</b> as recited in claim 45, further comprising computer code for describing a format for the source data stream and the display device.	See claim 6 above.

The Instant application has a similar scope of invention as in US patent 7,068,686, but in different wording or format of claims. The common subject matter is a a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate;

a receiver unit coupled to the sink device; and a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a multimedia data packet stream formed of a number of multimedia data packets based upon the source packet data stream in accordance with a link rate that is independent of the native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the multimedia data packets from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa wherein when the multimedia data stream includes an audio stream and there is no associated time stamp, then the source device informs the multimedia sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.

12. Claim 7, 18, 27 38, are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,2,13-15 of U.S. Patent No. US 7,068,686 in view of Wolf et al (US 6,914,637 B1).

For claim 7, 18, 27 38,, claims 9,11,22,23 of U.S. Patent No. US 7,068,686 teach the claimed invention as described in paragraph 11.

Furthermore, claims 9,11,22,23 of U.S. Patent No. US 7,068,686 teach, wherein the source data stream is packetized over the respective virtual link (see claim 9).

Patent No. US 7,068,686 does not disclose:

For claim 7 and 27, a mapping definition.

For claim 18 and 38, wherein the number of multimedia data streams are multiplexed to form a single data stream suitable for transmission over the linking unit.

Wolf from the same or similar field of endeavor discloses a display system/interface with a mapping features:

For claim 7 and 27, Wolf discloses a mapping definition (see column 21 lines 59-61 “code word...mapped to source data”).

For claim 18 and 28, Wolf discloses wherein the number of multimedia data streams (see Figure 2 “DigVideo” and Figure 8 “Packet 1”, “Packet 2...” are multiplexed (see column 29 lines 37-42 “two or more streams...time-multiplexer”) to form a single data stream ( Figure 8 “Packet 1”, “Packet 2...” suitable for transmission over the linking unit (see Figure 2, CH0-CHC and column 29 lines 39-41 “multiplexed...one ...Channel”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Patent No. US 7,068,686 by using the features, as taught by Wolf, in order to a mapping features for a source (see column 21 lines 59-61).

### ***Claim Rejections - 35 USC § 112***

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claim 14, 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For claim 14, the claim limitations “cycle clock frequency period” in line 2 is not clear. It is not clear if the applicant is referring to frequency or period. Similar problems exist in claim 34.

*Claim Rejections - 35 USC § 102*

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

16. Claims 41-43 are rejected under 35 U.S.C. 102(e) as being anticipated by Wolf et al. (US 6,914,637 B1), hereinafter referred to as Wolf.

For claim 41, Wolf discloses a packet (see column 8 lines 50-55 “packet ...sub-packet”) based video interface (see Figure 2, 2’) for coupling (see Figure 2, CH0-3) a source device (Figure 2, 13) and a display device (see Figure 2, 26), comprising:

a source application layer (see Figure 2, 13 “MPEG2” and 1’) arranged to provide a source (see Figure 2, 13) data stream (see Figure 2 “DigVideo” and Figure 8 “Packet 1”, “Packet 2...”), a data stream format (see Figure 8, “Control Data”, “Data Island”, “Control Data”, “Video Data” and column 10 lines 35-40 “format in

which video data”), a number of data stream attributes (see column 6 lines 9-11 “stream...same clock frequency”), and a stream identification number (see Figure 8 “Preamble” and column 7 lines 50-60 “identify...data island...active video period”);

a source link layer (see column 29 lines 37-42 “two or more streams....time-multiplexer”) coupled to the source application layer (see Figure 2, 13 “MPEG2” and 1’) arranged to provide link initialization (see column 43 lines 4-15 “initiate and HDCP authentication....setting up transmitter”) and video interface management functions (see column 43 lines 5-23 “transmitter to enter the Data Island Mode....trigger the receiver’s entry into the Data Island Mode...query ...registers...verify”);

a source physical layer (see column 3 lines 16-25 “DVI” and Figure 13 “TMDS Link” and Figure 2 “DDC” “TMDS Tx” “Video”, 1’) coupled to the **source** link layer (see column 29 lines 37-42 “two or more streams....time-multiplexer”) that includes,

a source logical layer ( see Figure 2, 13 and column 55 lines 42-55 “unit 151....packetized data island” and column 47 lines 27-30 “Transmitter...packetizing”) arranged to at least packetize data ( see Figure 2, 13 and column 55 lines 42-55 “unit 151....packetized data island” and column 47 lines 27-30 “Transmitter...packetizing”).

scramble data (see column 53 lines 1-4 “TMDS-encoded”), generate link training patterns (see column 50 lines 14-20 “test pattern generator”). Encode (see column

53 lines 1-4 "TMDS-encoded") and decode data (see column 50 lines 28-32 "decodes that data"), and

a source electrical layer (see column 30 lines 60-65 "DVI specification" and see column 3 lines 16-25 "DVI" and Figure 13 "TMDS Link") that includes circuitry for initialization (see column 43 lines 4-15 "initiate and HDCP authentication....setting up transmitter"), parallel to serial (see column 29 lines 37-42 "two or more streams....time-multiplexer" and column 36 lines 60 "multiplexer")

and serial to parallel conversions (see column 49 lines 60-65 "demultiplexing" and Figure 2 "AnVideo", DigVideo", "SPDIF", "MCLK"), and spread spectrum capable PLLs (see Figure 13 "Filter PLL", "Main PLL");

a bidirectional auxiliary channel (see Figure 2, "DDC" or "CH0-C") coupling the source c b k e physical layer (see column 3 lines 16-25 "DVI" and Figure 13 "TMDS Link" and Figure 2 "DDC") and a display device physical layer (see Figure 2, 2' 26) arranged to transmit information (see Figure 2, "AnVideo", "DigVideo") between the source physical layer (see column 3 lines 16-25 "DVI" and Figure 13 "TMDS Link" and Figure 2 "DDC")

and the display device physical layer (see Figure 2, "Display Circuitry") and vice versa; and a unidirectional main link (see column 4 lines 57-66 "unidirectionally....TMDS link") coupling the coupling the source physical layer (see column 3 lines 16-25 "DVI" and Figure 13 "TMDS Link" and Figure 2 "DDC" "TMDS Tx" "Video", 1') and the display device physical layer (see Figure 2, 2' 26) arranged to transmit information (see Figure 2 "TMDS Tx")

between the source physical layer (see column 3 lines 16-25 "DVI" and Figure 13 "TMDS Link" and Figure 2 "DDC" "TMDS Tx" "Video", 1') and the display device physical layer (see Figure 2, 2' 26).

For claim 41, Wolf discloses a display device application layer (See Figure 2, 23, 25) arranged to provide (see Figure 2, 23, "DDC", 15 and column 46 lines 6-15 "determine the capabilities and characteristics of the receiver") a set of display attributes ((see Figure 2, 23, "DDC", 15 and column 46 lines 6-15 "determine the capabilities and characteristics of the receiver") to the source application layer (see Figure 2, 13 "MPEG2" and 1' "HOST I2C"); and a display device link layer (see Figure 2 "DDC" and 2', "HOST I2C") coupling (see Figure 2 "DDC" and 2', "HOST I2C") the display device application layer (See Figure 2, 23, 25) to the display device physical layer (see Figure 2, CH0-CHC "TMDS RX").

For claim 43, Wolf discloses wherein the display device application layer (See Figure 2, 23, 25) and the source application layer (see Figure 2, 13 "MPEG2" and 1' "HOST I2C") are each an application programming interface (see Figure 2, 13 "MPEG2" and 1' "HOST I2C" and Figure 2, 23, 25 and column 13 lines 22-25 "program generated", column 43 lines 3-20 "programmed", column 58 lines 5-15 "programmed") that describes a format (see column 10 lines 35-40 "format ... video data") for the source data stream (see Figure 8, "Control Data", Data Island", "Control Data", Video Data" and column 10 lines 35-40 "format in which video data") and the display device (see Figure 2, 2' "Video", 26).

### ***Conclusion***

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenan Cehic whose telephone number is (571) 270-3120.

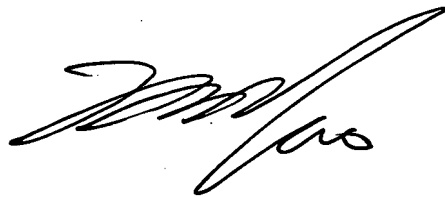
The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KC

KWANG BIN YAO  
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Kwang Bin Yao', is written over the printed name and title.